

## NOTES ON AUSTRALIAN SHIPWORMS.

BY C. HEDLEY, F.L.S.

(Plate XXXII.)

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By the good offices of Dr. Stirling, C.M.G., F.R.S., Director, and of Mr. Bednall, Hon. Curator in Conchology of the Public Museum, Adelaide, the Australian Museum has recently received from that Institution a fine series of *Teredo*, under the name of *T. fragilis*, Tate, taken mining eucalypt wharf piles at Port Adelaide, South Australia.

An appeal as to its identity with *T. fragilis* to the author of that species is impracticable, since, as these lines are being penned, Prof. Tate is engaged in exploring the MacDonnell Ranges in Central Australia, and therefore inaccessible to letters.

Should other discrepancies between the specimens before me and the figures and description of *T. fragilis* (Trans. Roy. Soc. S. Australia, 1888, p. 60, Pl. XI. figs. 13*a*, 13*b*, 13*c*) be explained as relating to an immature stage, yet the palette figured by Prof. Tate cannot be reconciled with that to which I now draw attention.

Of these specimens I therefore offer the following description under the name of

## TEREDO EDAX, n.sp.

Valves in natural contact globose. Shell white under an epidermis which anteriorly is thin, membranaceous, glossy and olive-yellow, but posteriorly coarse, brown, dull, brittle and easily shredding off in patches. Sculpture: parallel to its margin the

anterior area is crossed by close, delicate, most regular lamellæ, about a quarter of a millimetre apart; at right angles to these unite a series closer together and finely beaded on their umbonal aspect, which traverse the antero-median area parallel to its margin; on reaching the median area the sculpture loses its regularity, is deflected backwards and upwards, degenerating into vague striæ parallel to the margin of the posterior area. The auricles with part of the posterior and the whole of the umbonal region are too much eroded to exhibit sculpture.

Viewed from within, a prominent feature is the thin, flat apophysis which projects from the centre of the subumbonal ridge into the cavity of the shell for half the latter's length, its jagged edges parallel to the axis of the valves. From the apophysis to the posterior auricle the subumbonal ridge stretches as a shelf into the cavity of the valve. Along both anterior and posterior margins the shell is reinforced from within by a heavy layer of callus. Beyond the ventral tip each valve has projecting from within a little peg of callus, which is slightly excavated at its upper end. Hinge tubercles spiral, swollen, large, projecting downwards and interlocking each to each by spurred processes. Anterior adductor muscle scar covering most of the interior of the anterior area. Height 25, length 22, breadth 26 mm.

Palettes somewhat the shape of a cricket bat whose shoulders had been planed down; stalk with two notches at the end, from the lower of which runs a groove to the ring that marks the commencement of the blade; the latter a little concave within and convex without, shelly and like a *Sepia* shell for two-thirds of its length, membranous at the end. Length 27 mm. Breadth  $6\frac{1}{2}$ . This feature (fig. 5) ill corresponds with that drawn on Tate's plate, which rather approach the palettes of *Kuphus* (as illustrated on Pl. LXV. of Vol. xxv. of the Trans. Linn. Soc.).

As my sketch (Pl. XXXII. fig. 4) indicates, the tube of the species under discussion is for some distance partially choked by a series of imbricating plates.

From most species of its genus, this, one of the largest, is separated by the almost entire suppression of the auricle, in which

respect it resembles the two species of Wright's group *Nausitora*, whose scaled palettes, however, distinguish them.

At the request of Capt. Hutton, Sir James Hector, Director of the Colonial Museum of Wellington, N.Z., kindly loaned to me for study the type of *Teredo antarctica*, Hutton. This, as I received it, is unfortunately in a poor state of preservation. The two small, separate but corresponding valves are not accompanied by tube or palettes, both are broken and much smeared with shellac. The apophyses are missing in both valves and appear to have been snapped off short at their origin: each valve has suffered fracture of the margin of the antero-median area. Enough yet remains, however, to satisfactorily establish Hutton's species; the peculiar oblique auricle and the proportion of height to breadth mark *T. antarctica* from any of the genus with which I have been able to compare it.

Under these circumstances, I content myself with offering figures of the right valve of the type and, except to state that this valve is both in height and length 12 mm., refrain from adding to the description appearing on p. 133 of the "Manual of the New Zealand Mollusca."

That is amended from the original definition in the "Catalogue of the Marine Mollusca of New Zealand," and from the French description in the Journ. de Conch. 1878, p. 43. From these accounts Smith has with hesitation identified (Report on the Zoological Collections made in the Indo-Pacific Ocean during the Voyage of H.M.S. Alert, p. 93, Pl. vii. figs. E. E2.) specimens collected by Dr. Coppinger at Port Denison, Queensland, and also specimens dredged by H.M.S. "Challenger" off Cape York, Q. (*vide* Chall. Report Zool. xiii. p. 27) with *T. antarctica*. A comparison of the last quoted figure with those of the type now presented will, it is thought, increase to conviction the doubts expressed by the British Museum conchologist.

Besides *T. fragilis* and *T. antarctica*, three other kinds of ship-worms have been mentioned from Australian seas: *T. navalis*, Linné, probably by mistake, *Nausitora saulii*, Wright (Trans. Linn. Soc. xxv. p. 567, Pl. lxxv. figs. 9-15) from Port Phillip, Victoria,

and *Calobates australis*, Wright, (*Op. cit.* p. 564, Pl. LXIV. figs. 1-5) from Freemantle, Western Australia. Described from a defective specimen, the latter, suggests Prof. Wright, "may prove to be only an Australian form of *Calobates thoracites*, Gould."

Capt. Ferguson, Chief Harbour Master of Williamstown, gives many interesting particulars on pp. 8-11 of Report on Class III. "Indigenous Vegetable Substances," of the Catalogue of the Victorian Exhibition of 1861, of the boring of submerged timbers in Victorian waters. The damage he records is attributed to "*Teredo navalis*," but we are not informed that any scientific examination of the pest was made or its correct name ascertained. Effects of its destruction upon Red Gum, Blue Gum, White Gum, Stringybark, Blackwood, Sheoak, Teak and Swan River Mahogany are respectively tabulated. The last-named, or Jarrah (*E. marginata*), had, as elsewhere, completely resisted attack; next in endurance was Red Gum; the worst, Teak, was completely riddled.\*

In the Proc. Roy. Soc. Van Diemen's Land, 1852, pp. 74-77, Sir William Denison discusses the "Operation of *Teredo navalis* on Colonial Timber." Two trees [supposed by Maiden (*Useful Native Plants of Australia*, p. 34) to be *E. globulus* and *E. amygdalina*] employed as piles at the Franklin Wharf, Hobart, were much worm-eaten. In his "Census of the Marine Shells of Tasmania," Tenison Woods mentions on p. 47, "*Teredo navalis*, Linné, rare, and probably introduced." Gray alludes to a Tasmanian *Teredo* (P.Z.S. 1857, p. 246).

In N.S.W. and Queensland shipworms are by boatmen, fishermen, and the waterside folk generally, termed "cobra," a word which, like dingo, yarraman, kangaroo, &c., is considered by the Europeans to be aboriginal, and by at least most aboriginal tribes to be English. The blacks esteem "cobra" highly as an article of food, devouring them raw. Having ventured to taste, my palate compared it to an oyster.

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\* Sir F. von Mueller writes, *Eucalyptographia*, Decade iv., that, "next to the Jarrah, *E. rostrata* best resist the attacks of *Teredo*." For particulars of the former, see Decade iii. of the same work.

A Moreton Bay oysterman once told me that when lying on the floor of his craft, on a still summer night, he could distinctly hear the cobra gnawing in her planks.

As confirming this observation, Mr. C. W. Darley has kindly drawn my attention to Mr. Lamb's statement, Trans. Am. Soc. Civil Engineers, Feb. 1894, Vol. xxxi. p. 239. "On still summer nights I have heard them grinding their way into the wood, and the noise of their grinding would surprise you if you should put your ear to the head of a pile in which they were at work."

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#### EXPLANATION OF PLATE.

Fig. 1.—Exterior of right valve of *T. edax* enlarged; sculpture of antero-median area magnified.

Fig. 2.—Interior of the same.

Fig. 3.—Anterior aspect of valves of *T. edax* in apposition; natural size. Type.

Fig. 4.—Tube, broken to show concamerated structure, of *T. edax*; natural size.

Fig. 5.—Palette of *T. edax*; enlarged.

Figs. 6 and 7.—Interior and exterior aspects of imperfect right valve of type specimen of *T. antarctica*, Hutton. Sculpture of antero-median area magnified.

